Orthopedics Orthopédie

Veterinary Orthopedic Society 2010

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The 37th annual convention of the Veterinary Orthopedic Society was held in Breckenridge, Colorado from February 20 to 27 and featured an assortment of interesting presentations in the area of veterinary orthopedics.

A prospective study of cranial cruciate rupture therapy from the University of Minnesota compared medical and surgical treatment in overweight dogs. Patients with unilateral cranial cruciate ligament ruptures were randomly assigned to medical and surgical groups. The medical group was placed on a weight-reduction diet, was treated with non-steroidal anti-inflammatory medication, and a physiotherapy program was initiated. The surgical group received the same treatment after undergoing a tibial plateau leveling osteotomy (TPLO). Post-surgical outcomes were measured by way of owner questionnaires, radiographs, physical and gait examination, and force plate gait analysis at 0, 6, and 12 wk. The only significant difference, as measured by the investigators, was in body weight for both groups between the beginning and end of the study. No difference was noted between the groups in weight-bearing as measured by the force plate (1). It may be tenuous to suggest these data, as interesting as they may be, would indicate that medical and surgical treatments of cranial cruciate rupture are equally effective. First, few surgeons would expect a post-surgical patient to return to completely normal function by 12 wk post-surgery, although most would be using the limb quite well based on a visual assessment. Second, although force plate analysis is useful as an objective measure of lameness and orthopedic function, it has several limitations including variation in measurements obtained in different passes with the same patient, and between different individuals and breeds of dogs (2). At the very least these data confirm that we have yet to identify the definitive method for measuring post-surgical outcomes and, by extension, the definitive therapy for this condition.

Another paper from the University of Minnesota may shed further light on the data. A prospective study looked at "the placebo effect" on responses by owners on questionnaires and on examinations by veterinarians (3). A group of dogs with grade 2 or greater lameness due to osteoarthritis were enrolled in the randomized, placebo-controlled trial. They were evaluated on subsequent visits by measuring ground reaction force (GRF) on force plate gait analysis. Changes of at least 5% or greater in GRF were considered significant changes from one visit to another. Owners or veterinarians who described an improvement in the dog's lameness when the GRF was either unchanged or worse were marked as a "placebo effect." The researchers found that a placebo effect was evident in owner response to questions between 53% and 57% of the time. Veterinarians did not fare much better in underestimating pain and lameness on physical examination almost 52% of the time (3). We are all free to wonder whether this uncertainty emanates from the placebo effect, the force plate, or from the variable nature of osteoarthritis itself, but the uncertainty is undeniable!

Incomplete ossification of the humeral condyle has been identified as a causative factor in Y or T fractures of the distal humerus, especially in spaniel breeds. Specifically, a fibrous nonunion has been identified in the intercondylar region of the distal humerus which predisposes to fracture even in the face of minimal trauma. An examination of unilateral distal humeral condylar fractures in adult dogs was undertaken in order to identify the frequency of incomplete ossification in the contralateral humeral condyle and the best means of identifying the incomplete ossification. Computed tomography (CT), used as the definitive diagnostic tool, was compared with radiography in terms of sensitivity and specificity. Six of 14 dogs with distal humeral condylar fractures were found to have incomplete ossification of the contralateral distal humerus; 4 of 8 spaniels fell into this category. Plain radiographs were sensitive enough to detect the incomplete ossification 83% of the time with a corresponding specificity of 100% (4).

A clinical association between the use of non-steroidal anti-inflammatories and delayed fracture healing has been noted in humans but no data has been published on this topic in dogs. An in vitro study was presented using bone marrow-derived mesenchymal stem cells in culture exposed to carprofen. The data showed a significant decrease in the rate of vascular endothelial growth factor gene expression which may lead to decreased osteogenic differentiation and delayed bone healing in a clinical setting, although that requires more examination for confirmation (5).

Agility competition is a popular pursuit among dogs and dog owners and is associated with extraordinary levels of exertion by many competing dogs. Two studies of agility dogs attempted to quantitate the degree of stress from exertion associated with training and competition (6,7). F2 isoprostane can be measured in urine as an indicator of oxidative stress after athletic exertion. Agility competition was found to significantly increase levels of F2 isoprostane and these levels had not returned to normal by

4 h after activity. Eicosanoids, specifically thromboxane B2, are indicators of inflammation that can also be measured in urine. Thromboxane B2 levels were found to be significantly increased in agility dogs after exertion but were especially elevated in the best competitors. These findings indicate significant inflammation and oxidative stress in agility dogs. Much more can be learned to determine the significance of this to the dogs' performance and long-term well-being or to suggest ways in which these processes can be controlled by training techniques, rest periods, nutrition, or other management practices (6,7).

References

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